

Direct fifth order block backward differentiation formulas for solving second order ordinary differential equations

ABSTRACT

In this paper, a new fifth order Direct Block Backward Differentiation Formula (5-DBBDF) for solving second order stiff ordinary differential equations (ODEs) is presented. Five backwards steps are used to generate the coefficients of the 5-DBBDF. This method approximates the solutions at two points concurrently by using fixed step size and solved the second order ODEs directly without reducing the ODEs to a system of first order. Numerical results on some standard problems found in the literature are presented to validate the accuracy of the proposed method.

Keyword: Block method; Second order ODEs; Stiff